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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,085	03/25/2004	Feng Liang	FGT 3G4 (81099482)	9750
36865	7590	09/06/2005	EXAMINER	
ALLEMAN HALL MCCOY RUSSELL & TUTTLE, LLP 806 S.W. BROADWAY, SUITE 600 PORTLAND, OR 97205			RIDDLE, KYLE M	
			ART UNIT	PAPER NUMBER
			3748	

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,085

Applicant(s)

LIANG ET AL.

Examiner

Kyle M. Riddle

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-14 and 16-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8, 10, 17-20 and 22-25 is/are allowed.
- 6) ☒ Claim(s) 11-14, 16 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Comment

1. Regarding claim 1 in applicant's amendment received 15 August 2005, the amended claim 1 has the preamble "A system comprising:" and dependent claims 2-8, and 10 cite dependence in their respective preambles to "The actuator of claim 1". The arguments presented on page 9 of the amendment suggest the dependent claims should refer back to a system and not an actuator.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 11-14, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Guerin et al. (EP 1174595 A1).

Re claim 11, Guerin et al. disclose a valve actuator comprising:

- a pair of electromagnets 60, 61 with coils or reels 63, 64 and core or polar parts 65, 66, 67, 68 (see translation, paragraphs 79-81 and Figure 3);
- permanent magnets 69, 70 inclined at an angle to the shaft or valve stem 76 and surrounded by the coils or reels 63, 64 (paragraph 81 and Figure 3);

- an armature or pallet 75 fixed to the valve stem 76 extending through the core or polar parts 65, 66, 67, 68 and axially movable to actuate an engine valve 77 of an internal combustion engine (paragraph 84 and Figure 3);

- the permanent magnets 69, 70 located at least partially inside the coils (Figure 3);

- at least an air gap adjacent to permanent magnets 69, 70 between end of permanent magnet 69 and left polar part 65, between end of permanent magnet 70 and left polar part 67, and between upper or lower electromagnets 60, 61 and armature 75 (Figure 3);

- the use of the angled permanent magnets 69, 70 with the electromagnets 60, 61 increasing the magnetic properties of the actuator and reducing losses (paragraphs 87-93).

Re claim 12, Guerin et al. disclose the permanent magnets 69, 70 being inclined between 5 and 85 degrees (Figure 3).

Re claim 13, Guerin et al. disclose the permanent magnets 69, 70 extending fully along a height of the coils (Figure 3).

Re claim 14, Guerin et al. disclose the permanent magnets 69, 70 being substantially fully inside of coils (Figure 3).

Re claim 21, Guerin et al. disclose the permanent magnets 69, 70 with portions at least partially below the coils with an inner portion closer to the coil than an outer portion, the inner portion being closer to a center of the core than the outer portion (Figure 3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being obvious over Guerin et al.

Guerin et al. disclose a valve actuator comprising a pair of electromagnets with coils or reels and core or polar parts, permanent magnets inclined at an angle to the shaft or valve stem and surrounded by the coils or reels, an armature or pallet fixed to the valve stem extending through the core or polar parts and axially movable to actuate an engine valve of an internal combustion engine, the permanent magnets located at least partially inside the coils, at least an air gap adjacent to permanent magnets between an end of the upper permanent magnet and left polar part, between an end of the lower permanent magnet and left polar part, and between upper or lower electromagnets and the armature. They, however, fail to disclose layering of the permanent magnets.

The inclusion of multiple layers of magnetic material in creating the permanent magnets is well known in many arts and would have been obvious to one having ordinary skill depending on space requirements, flux densities, and manufacturing considerations. Moreover, there is nothing in the record which establishes that the application of such a cross-section or layering represents a novel or unexpected result (See *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975)).

Allowable Subject Matter

6. Claims 1-8, 10, 17-20, 22-25 are allowed.

Response to Arguments

7. Applicant's arguments filed 15 August 2005 have been fully considered but they are not persuasive.

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8. Applicant's arguments, see page 9, last two paragraphs, page 10 through the middle of page 12, filed 15 August 2005, with respect to the rejection(s) of claim(s) 1, 11, 21, and 24 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Guerin et al. as cited above pertaining to claims 11-14, 16, and 21. The examiner in interpreting these claims in their broadest sense has determined that Guerin et al. discloses (either through the specification or drawings) each and every limitation cited in the claims pertaining to the 35 U.S.C. 102(b) rejection above.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of 3 patents.

- Hanai et al. (U.S. Patent 6,047,672) disclose a valve-driving electromagnetic valve with angular poles on each side of a permanent magnet.

- Lin et al. (U.S. Patent 6,615,780) disclose a solenoid apparatus with angular shaped portions within electromagnets.

- Gebauer et al. (U.S. Patent 6,684,829) disclose a gas shuttle valve with wedge-shaped ferromagnetic slides to vary the valve lift.

Communication

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle M. Riddle whose telephone number is (571) 272-4864. The examiner can normally be reached on M-F (07:30-5:00) Second Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kyle M. Riddle
Examiner
Art Unit 3748

kmr



THOMAS DENION
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